DIE CASTING ENGINEER

THE SOCIETY OF DIE CASTING ENGINEERS, INC.
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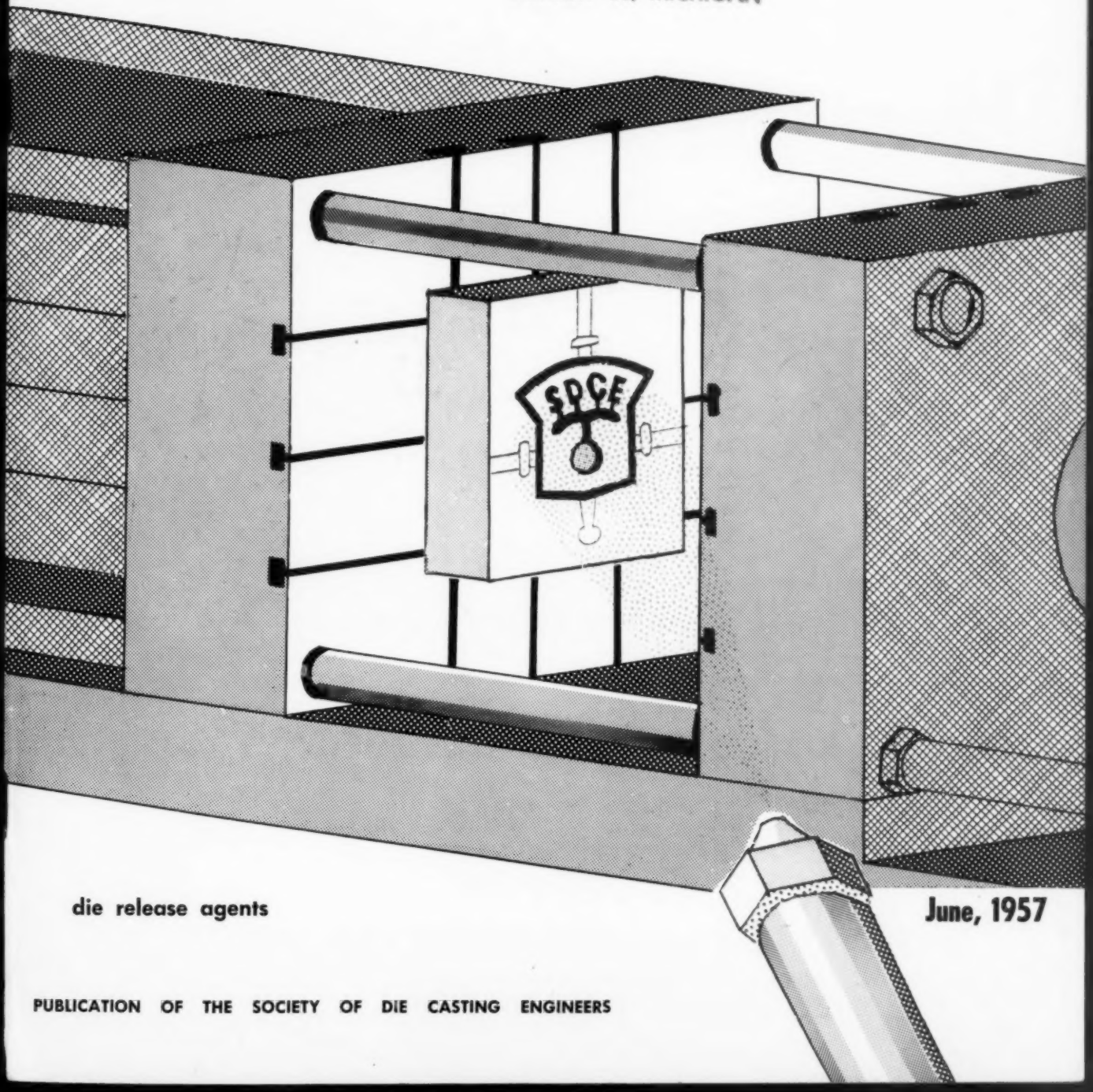
DETROIT 35, MICHIGAN



die release agents

June, 1957

PUBLICATION OF THE SOCIETY OF DIE CASTING ENGINEERS

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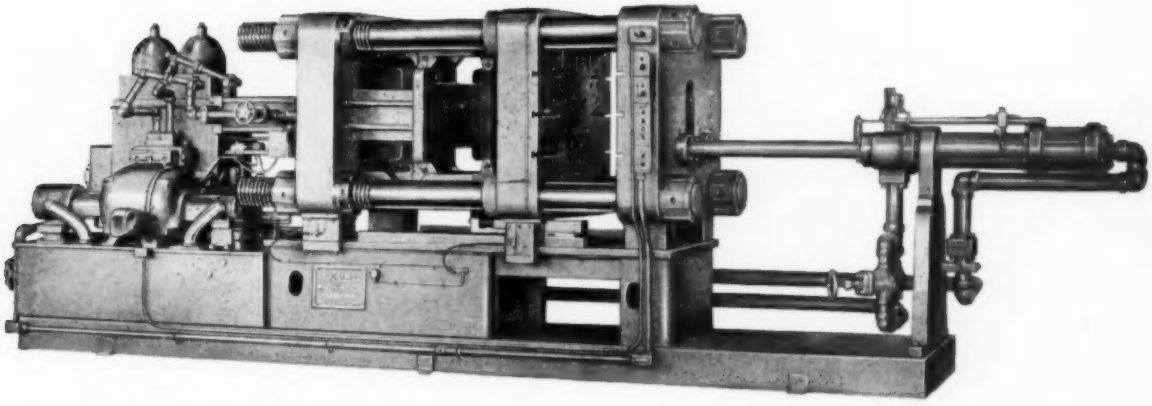

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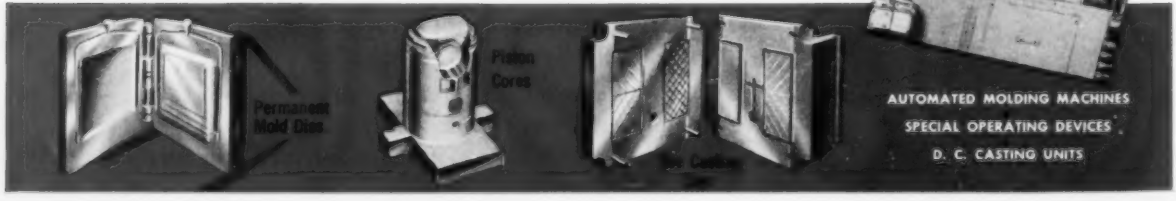

VOLUME 1
NUMBER 2
JUNE, 1957

DIE CASTING ENGINEER

Official Publication of
THE SOCIETY OF DIE CASTING ENGINEERS, INC.

STAFF

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FEATURES

DEPARTMENTS

The DIE CASTING ENGINEER is published quarterly by The Society of Die Casting Engineers, Inc.—a society for the improvement and dissemination of the knowledge of the arts and sciences of die casting, the finishing of metals, and the allied arts. The DIE CASTING ENGINEER offers a concentrated coverage of management and engineering in the die casting and directly related industries.

Only advertising pertaining to die casting and finishing of metals and the allied arts is acceptable. The Society reserves the right to reject any advertising deemed objectionable for any reason what-so-ever.

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Parting Line

Gentlemen:

Congratulations on your initial publication of *Die Casting Engineer.* We were very much impressed with this number and ask that we be put on your list of regular subscribers.

Very truly yours,
J. H. V.
President

Thank you—from the Society and from the staff. This is the kind of encouragement we need.—Ed.

Dear Sirs:

We read with interest Volume 1, number 1, March issue of your new publication.

We feel that there is a distinct interest on the part of people such as ourselves in your type of publication, particularly if you will adhere to the one subject and not branch out into the various ramifications which are more or less competitive and of secondary importance.

Other publications that we have seen on this subject are, naturally, interested in appealing to as many advertisers as possible as, of course, they are in business for this purpose, with the result that there are so many offshoots now being treated that the main objective of a die caster seems to be more or less lost in the shuffle.

Very truly yours,
R. L.

So aptly put. As is stated in the Preamble to the SDCE Constitution, this is our whole purpose in publishing the ***Die Casting Engineer.*** *We are proud to serve the Die Casting Industry in this capacity and intend to remain a means of communication solely for it. If at any time you notice that in some area we have wandered into one of the other ramifications, drop us a line and in no uncertain terms set us back on the straight-and-narrow.—Ed.*

Editor's Note: *We welcome all questions on the material presented in our feature articles. It is quite possible that your fellow die casters have the same questions and would be interested in the answers also.*

For Quality-Sure Die Castings

Westinghouse chose H-P-Ms

Westinghouse Portable Food Mixer. The upper and lower housing and internal gear case cover are all die cast on H-P-Ms.

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1877—1957

How to open . . . .

NEW LOCAL CHAPTERS

. . . . of the SDCE

by **GEORGE F. GRIFFENHAM**

Executive Secretary

THE PHYSICAL GROWTH of the Society of Die Casting Engineers is controlled primarily by the total number of its chapters. That total number at present is six, all united under the National Executive Offices.

A sizeable number of new S.D.C.E. chapters have been proposed, and some of these have even gained "Acting Secretaries" to lay down the ground work. The continental United States has been sectioned by the National Offices into 29 chapter territories to accommodate the present interest in the Society. With interest in these proposed territories growing by leaps and bounds, new chapters will be springing up across the country. To aid the men who will be assuming the responsibilities of "Acting Chairmen", we present this outline of the steps to be taken in the opening of a chapter of the Society of Die Casting Engineers.

The assignment of territories to the various sections of the United States has taken into account both the concentration of Die Casting activity and the current display of interest and participation in the Society. Therefore, some areas include more than one state while others include only a few counties, i. e. Michigan. To date the S.D.C.E. has opened the following chapters.

Detroit No. 1 — Detroit, Michigan

Saginaw Valley No. 2 — Flint, Michigan

Western Michigan No. 3 — Grand Rapids, Mich.

Toledo No. 4 — Toledo, Ohio

Chicago No. 5 — Chicago, Illinois

Cleveland No. 6 — Cleveland, Ohio

The National Board of Directors has approved the opening of the following new chapters when and where possible:

New England No. 18
(Active Secretary - Milton Harmon [1])

New York No. 7
(Acting Secretary - Theodore J. Kerekes [2])

Pittsburg No. 8

Syracuse No. 9

Canada (Ontario) No. 10

Cincinnati No. 12

St. Louis No. 17

Baltimore No. 19

San Francisco No. 20

Indianapolis No. 25

Los Angeles No. 30

Buffalo No. 34

1. CAST-MASTER, INC., 18 Rock Road, Milford, Conn.
2. COLUMBIA ENGINEERING CO., INC., 113-118 Sussey Avenue, Newark 3, New Jersey.

As indicated by the Ontario Chapter, a few foreign countries have been proposed for possible chapters in accordance with their die casting industries. At present they are Canada, England, Germany, and the continents of Australia and South America.

The Society has no particular order in which it intends to open these chapters. It will greatly depend on the co-operation and organizing of the interested die casters, particularly the one man who assumes the responsibility of the Acting Secretary in his area. As more chapters are approved the large territories will be subdivided to accommodate the new chapters. Since the territories as now designated have been arbitrarily set up, they need not prevent the organizers from obtaining help beyond them.

If a die caster becomes interested in spending some time contacting his fellow die casters, arranging meeting times and dates, and being the inspirational force behind the development of a new chapter, he will need to know the procedure for opening a chapter and the assistance he will receive from the National Offices. His first step will be to contact the National Offices in Detroit. From Detroit he will receive a copy of the Society's Constitution and Bylaws, an outline of the particular chapter's boundaries, rosters of prospective members, and the equipment and other information necessary. This first contact will prevent a possible duplication of effort.

The "Acting Secretary" will receive clearance from the National Offices, giving him the go-ahead to call a chapter meeting of the Society of Die Casting Engineers. An excellent guide in the preparation for the day of opening is given in the National By-Laws which contain all Society regulations and an outline of the opening procedure.

In order to arouse as much interest as possible in the Society and the opening of its chapter in their area, the "Acting Secretary" will then prepare a series of lists of the interested, qualified producers, suppliers, students, and general personnel. These lists will include names, companies, titles, mailing addresses, cities, zones and states. The men on these new lists along with the membership list supplied by the National Offices will then be contacted for their attendance at the organizational and opening meetings.

As an attraction for the organizational meeting, to be held in a popular, high quality restaurant, a speaker should be invited to speak on a subject of interest to die casters and those affiliated with the industry. He should speak not longer than 45 minutes at this first meeting, since the preliminary organizational business must be taken up that evening. The business will include such subjects as the best possible date for monthly meetings and the best centralized meeting place.

A representative from the National Office or an appointed member who has a knowledge of Chapter procedure will be assigned to aid the "Acting Secretary" and his aides in officially opening the chapter. The National Office, however, must be notified of this in advance.

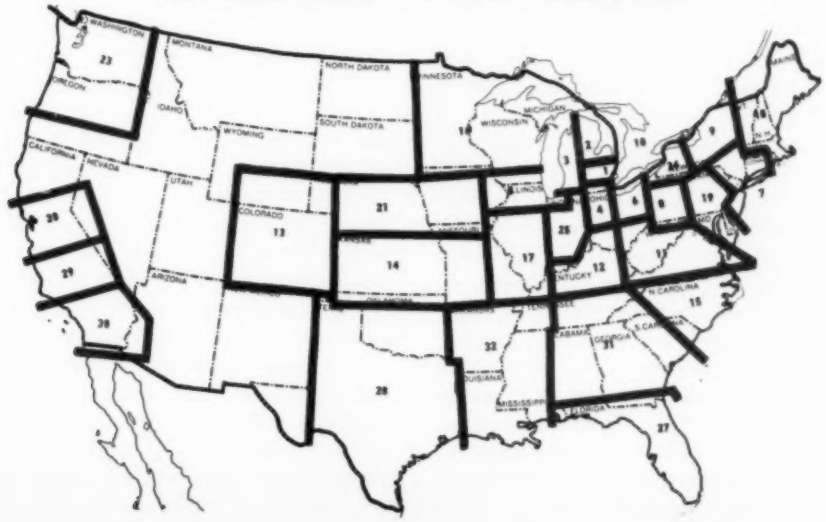
As the ball starts really rolling toward the big opening meeting a campaign is set into motion to acquire at least 50 members within a set time, say 30 days. A special meeting is called, the second one so far, to review the progress of the campaign and to complete the necessary details for the official opening meeting. It is suggested that six committees, Membership, Nominating, Publicity, Speaker, Arrangements, and Tickets, be formed and functioning prior to the big meeting. If 6 or more pitch in on these committees their jobs will be light and the work will be done efficiently.

Now for the BIG day. The main event of this meeting, the third in the list so far, is the Election of Chapter Offices, which officially opens and establishes the chapter.

As a final word; Good Luck.

■ ■ ■

PROPOSED SDCE CHAPTER TERRITORIES



Selection of your . . .

Die Release Agents

by TOM E. MURRAY

Service Engineer

E. F. Houghton & Co.

FOR YEARS THE SELECTION of a die face mold coating has been on the basis of individual experience, or by using cut-and-try methods. Recent extensive surveys in job shops throughout the country now make it possible to approach this problem in a more orderly fashion.

A prime function of a mold coating is to prevent adhesion of the casting metal to the die. While this application is immediately recognized, there are additional functions equally as important. A mold coating should provide a tough, heat resistant film with cooling or cushioning action at the die surface. This film protects the die surface from radical temperature changes, eliminating considerable surface stresses in the die blocks and premature failure of these expensive tools.

The mold coating should provide clean castings, with good, smooth surfaces. When we say "clean castings," we do not mean they should be immediately ready for plating, but rather that they should fit into the regular or standard cleaning cycle without requiring special handling. There should be no tendency for the coating to build up in the die cavity after repeated application, as this makes the maintenance of close tolerances difficult. While we realize that coatings will tend to build up in time, this can be kept to a minimum if the coating is such that it can readily be cleaned from the mold.

The mold coating should resist gas development. The ability of a coating to resist gas development at operating temperature is of prime importance in the production of sound castings.

The kinds of mold coatings used in the die casting industry to date are:

1. Heavy mineral oils, such as cylinder stocks and steam refined stocks.
2. Light mineral oils - 100 SUS @ 100°F.
3. Waxes and petrolatums.
4. Beeswax.
5. Fatty oils, such as tallow, lard oil, cottonseed oil, rapeseed oil, fish oils, hydrogenated fats and palm oil.
6. Pigment and oil suspensions.
7. Pigment and water suspensions.
8. Silicone fluids.

These materials may be used individually, or in combination with each other. In general, the fatty oils and waxes provide the desired mold coating properties in themselves, whereas the light oils and mineral stocks are present as vehicles.

As a result of the surveys previously mentioned, the following trends have been established in the use of mold coatings in the die casting industry.

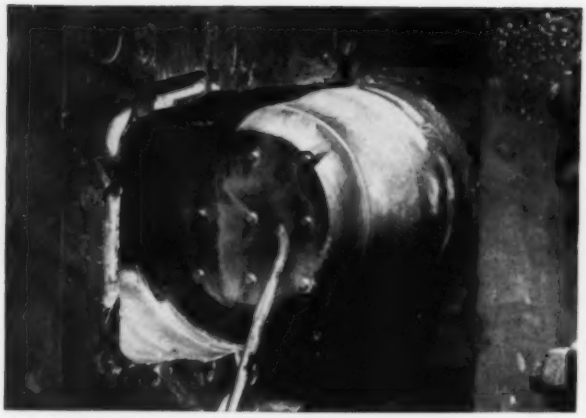
For the pressure casting of tin, lead or zinc, particularly thin sections in non-complicated dies, the heavy mineral oils or cylinder stocks are used, as well as

highly compounded products using these materials as base stocks. These mold coatings are dark in color and have a viscosity of 600-650 SUS @ 100°F. They produce a light, tough film at die temperatures of 350-550°F. and lend themselves particularly to castings which are cleaned prior to plating. These materials are used either straight or they are blended with small percentages of fatty oil to promote rapid wetting-out and adhesion to the hot die surface. Their consistency is such that they can be applied by brushing or spraying. This type of coating may be diluted 5:1 with kerosene or light mineral oils for use on low melting tin alloys or very thin sections.

For the casting of heavy sections of zinc or light sections of aluminum, waxes and petrolatums are used for the mold coating. These materials produce an extremely tough, lasting film at die temperatures of 450-600°F. They are of light grease consistency, having melting points of approximately 130-140°F., and they produce fairly clean castings. These coatings are often used to touch up hot spots in the dies normally coated with the more fluid mold coatings previously mentioned. The coating material is usually heated to a flowing consistency and brushed or swabbed sparingly on the die, making sure to eliminate any oil runs. Where a number of small parts are to be cast each shot, the waxes or petrolatums are cut with kerosene or pale oil and may be sprayed on the mold. Castings produced with these materials are suitable for plating after conventional cleaning methods have been employed.

A similar preference is noted in the die casting of aluminum parts. For precision finish of light multiple cavity castings, such as used by the aircraft industry, a fluid type coating is used consisting of a bright stock oil having a viscosity of 110 SUS @ 210°F. and a flash point of 460°F. fortified with a metallic pigment or graphite. Metallic pigment offers the advantage of cleaner castings and is more generally accepted in the industry. Molten metal temperatures encountered in the use of this type of compound range from 1180°F. to 1350°F., and die temperatures range from 450 to 550°F. according to the size and the design of the part being cast and the number of cycles per minute. This kind of mold coating is applied by spraying on the die surface with an air spray gun using air pressures up to 75 pounds. It is important that this mixture be kept agitated during use to provide a uniform dispersion of the pigment in the oil vehicle and thus assure a uniform coating on the die. For small precision castings, this kind of coating may be further diluted 5:1 with kerosene or light oil. At a dilution of 11:1 with kerosene, this coating has been found satisfactory on zinc carburetor parts where subsequent cleaning or plating is not required. At 11:1 dilution, as many as 20 shots per die lubrication have been obtained.

Where die temperatures of 650°F. are encountered in the casting of heavier aluminum parts, a heavier or paste type mold lubricant consisting of cylinder stocks and pigment is indicated. The higher viscosity of 600-700 SUS @ 100°F., and the higher flash point of 650°F., together with the pigment content combine to make a better mold coating when the casting is large or heavy. Such parts include automatic transmission parts for automobiles. Once again, we note that the cleaning of the casting or plating is not required. This type of coating is used neat and swabbed on the die. Usually, agitation of the coating material is not required unless the product is diluted prior to use. Dilutions of 5:1 to 10:1 of the coating have produced satisfactory castings for auto parts, hydraulic



Spray application of release agent to the core and die.

Easy and clean removal of the hot casting from the die.

valve castings, motor housings and shallow cavity functional parts.

About the beginning of the year 1951, silicone fluids were made available to the die casting industry as mold release agents for aluminum, zinc and other metals and alloys. Silicone fluids are inert and do not react chemically with other materials. They are resistant to heat and thus there is no carbonization or fouling of molds. They possess excellent release properties between the metal being cast and the die. Their low surface tension allows them to penetrate into small cavities, and spread out to cover large areas quickly and evenly.

Silicone fluids may be applied by wiping, brushing, or spraying, depending on the application. Silicone fluids are usually applied from emulsions with water. Actually, the silicone fluid is a release agent and the water is only a diluent or means of getting the silicone fluid to the die surface. When silicone emulsions are used, softened water solutions should be made. The mineral salts contributing to hard water build up a scale. This scale must be removed periodically or it will build up in the die cavity, making it difficult to hold tolerances and maintain detail. The normal dilutions for die castings are such as to obtain a one to five per cent solution of silicone fluid. Application will vary from once for each casting produced to only three or four times per shift. The number of releases to be expected can best be determined by trial on the specific application.

In the die casting of copper alloys, present practice is limited to the use of those alloys that have melting points not exceeding 1650°F. Aluminum bronzes, low brasses and other high copper alloys can be die cast readily, but the melting points and casting temperatures are too high to be feasible or economical considering their effect on die materials currently available.

Pigmented mold coatings are required for the high temperatures involved in the die casting of brass. Those containing graphite have proven most promising at the higher die temperatures required for casting of these alloys.

There has been a widespread increase in the use of compounded mold coatings in the past few years. Increased effectiveness of these coatings over conventional oil films stems from the inclusion of lubricity additives, suspending agents to maintain a uniform dispersion of pigments, wetting-out additives to insure a rapid and complete spreading of the lubricant over the die surfaces, and adhesion agents to hold the coating in place against the washing action of the cast metal.

The effective performance of mold coatings is governed to a large extent by the variables in their compositon. Such factors, as percentage of additives and type of additives, must be considered. To illustrate let us hypothetically formulate or compound a pigmented type mold coating. We will assume the pigment used is graphite and the vehicle a cylinder stock. In the selection of the percentage of graphite to be used, we would find this more critical than we would normally expect. Too much grapite will cause a build up in the die cavities rendering the reproduction of detail difficult or impossible. Too little graphite will result in poor release or, possibly, soldering of the cast metal to the die.

The following factors in the selection of the graphite must also be considered:

1. Particle size
2. Particle shape
3. Particle orientation
4. Ash content

The flake form of graphite has several advantages over the amorphous or pulverized type. The flake form

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FOR THE PRODUCT DESIGNER–

General Problems of Die Casting Die Design

Many times the product designer destines his work to be produced by die casting. He may do this without first considering the problems of the die designer who must weigh product quality with economics. With a mutual understanding between product and die designers the quality of many die castings can be improved.

by ALFRED SUGAR

Vice-President and Technical Director
Alloys & Chemicals Mfg. Co., Inc.

A DIE CASTER'S PROBLEMS really begin when a part is still no more than a gleam in the designer's eye. That would be the ideal time for the designer and the die caster to get together in order to discuss common problems and arrive at the best possible conclusions. A designer knows what he must have in the part under consideration. The die caster knows what to do and what to avoid so that economies in die casting production and subsequent finishing may be realized.

To begin with, a designer should be made to bear in mind that die castings are made in metal dies, and that these dies are long lived and cannot be scrapped or broken up to remove castings. Since dies, cores, and slides are rigid structures, the designer of the casting must be made to visualize the casting in such a die. He must then consider what must be done to fill the die and what is needed to get the frozen casting out of the die without injury to either die or casting.

The size of castings should be kept within reasonable economic limits. Die costs go up with larger castings, and larger machines operate on a slower cycle. However, if the larger casting means less machining and less assembling, it may be the best alternative. Even if a die has to be rather complex and expensive, its cost may be justified if certain operations can be avoided.

One of the chief advantages of any casting process is that within certain limits wall thickness can be varied so that strength is proportional to the stress the section must withstand. In the average die casting, stresses are commonly low, and in many cases the thinnest casting that can be readily produced has more than enough strength and ample stiffness. Since the cost of a casting increases as its weight increases, it is preferable to have the wall sections as thin as possible so long as production and application requirements are met. Where changes in section are necessary, it is highly desirable that the transition be gradual for manufacturing reasons as well as to get better mechanical properties. Abrupt changes in section thickness are likely to produce porosity in the heavy areas and to slow down the operating cycle. A simple die casting often takes the place of a number of parts and thus saves machining, handling, and assembling costs. An intricate appearing die casting may be quite simple to cast if section thicknesses are kept balanced throughout the casting.

Further aids to the designer

Another aid to the die caster and generally controlled by the designer are ribs, beads, bosses and fins. Ribs and the like help to avoid stress concentrations in the casting as well as to increase its strength and stiffness and to minimize warpage in the finished casting. Ribs promote the flow of molten metal through the die and are a great help in filling out a casting. Bosses generally add to the utility of castings and wherever possible are cored or made to hold inserts for a particular use or for fastening. Wherever possible, the rib section should be the same as the casting section. Fillets should be used everywhere to avoid sharp interior corners and edges should be rounded to avoid defects and stress concentrations. Die construction, casting, and all become easier when edges are round and generous fillets are used. The one exception to this general statement would be the outside edge on a casting at the die parting and even this will be rounded in polishing.

Clean exteriors free from non-essential projections and streamlined shapes are highly favored. Beading, low relief, and other expedients to break up flat or uninteresting surfaces or to mask minor defects are frequently recommended and often used.

Naturally, unless die cost can be amortized by savings realized through the known number of die casting

needed, investment in a die may prove unwise. For this reason, die cost is often a determining factor in deciding upon the production method. Efforts to hold this cost within reasonable limits ought to have their share of attention. Often the cost of the application of a die slide or some other feature to the die is fully justified by economies in metal or in features on the casting that may be sacrificed unless a slide is employed.

It is desirable and may even be essential for the designer to take into consideration which type of alloy is to be used and, in some cases, which analysis under this type is to be chosen. Reasons for this include the fact that castings which are entirely feasible in one type of alloy cannot be satisfactorily made in another.

Changes in die casting equipment and in practice also influence casting design. Castings not regarded as feasible a few years ago are entirely practical today. Larger machines permit larger castings and faster smaller machines help to reduce the cost of small castings.

Die casting competes

It is well for the designer to remember that except for very small and quite simple parts, the die casting can compete with almost any non-ferrous stamping and with many ferrous stampings if the casting alloys available are suitable for the particular set of conditions encountered. Except for certain classes of quite small screw machine products, the die casting is likely to be cheaper if a non-ferrous alloy is specified. Many screw machine products have been displaced by die castings on a strictly competitive basis.

Few things aid so much in the design of any high production product as does the study of similar products already in production. Such a study acquaints the designer with what has been done and has proved economical. It also informs him as to what is feasible and what, though feasible may have drawbacks whose bearing on overall costs and general suitability needs to be watched. Often the study suggests expedients and new features which have great merit.

Since all die casting is done under heavy pressure, provisions must be made so that dies may be securely locked. The die must of necessity be in at least two parts. It is preferable to have the closure or parting of the die flat. Skip partings are feasible but increase difficulties and cost of machining and fitting the die, render the sealing of the die halves more difficult and present the danger of edge chipping at the irregular sections.

If the side walls of the casting are undercut, or contain recesses which cannot be formed by an integral part of the die, these walls must be formed by slides or members attached to the slides which are given transverse or angular motion relative to the die block. Such slides, which may include cores, can be made to operate independently. A die built in this manner will be rather expensive. Changes in casting design are often warranted if they will eliminate the use of slides.

When a die is locked ready for casting, metal is injected through a sprue hole and then through runners which may have one or more branches into the die cavity or cavities it must fill. Means for the escape of air in the cavities must be provided in the form of vents, otherwise the casting will not fill or it will contain entrapped air. Vents are commonly provided at the parting of the die in the form of slots up to .005" deep. Some air also passes out through clearance space at slides and moveable cores. Molten metal tends to follow escaping air, but the spaces are so thin that it freezes instantly forming a flash on the casting and preventing the further flow of metal through the vents. Flash is often the measure of the soundness of a casting. Vents should be so placed that all of the air in the cavity will be expelled by the entering metal and not entrapped by the casting.

Size and location of gates

There are no fixed rules which determine the location and size of gates. Before a die is placed in service, it is very likely that several gating and venting changes will be made. In addition to directing metal flow, gates also influence the soundness and surfaces finish of a casting. A thin gate will break away from the casting easily, thus make for easy trimming and minimum blemish on the casting along the line of breakage, but

(Concluded on Page 24)

SDCE National Committee sets its first goal toward—

STANDARDIZATION

by Meyer R. Tenebaum

DIRECTION AND METHOD of approach to the problem of standardization in Die Casting have been proposed by the S.D.C.E. National Committee on Standardization. First, the local chapters of the S.D.C.E. would be contacted by the National Committee as the initial step in their organization of local study committees. These individual committees would study the many issues involved, reporting periodically to the National Committee on the information they have gathered and the possible methods of standardization. As the data would come in, they would be processed according to the items under consideration, digesting the information and suggested standards into a single standardization for each case studied. When this work was completed, the National Committee would meet to summarize their findings into those standards that would be necessary and expedient.

Secondly, the National Committee would call upon machine manufacturers to attend a joint meeting. At this meeting the S.D.C.E. would present its summarized findings as suggestions and requests to the machine manufacturers. Primarily, they would be expressions of desire and need in the Die Casting Industry which the S.D.C.E. represents.

The whole purpose of the National Committee is that through cooperation and mutual understanding between the users of die casting equipment and the manufacturers of that equipment there would exist a formulation of real standards. The National Committee wishes to emphasize that neither it nor the Chapter Standardization Committees will *set* any machine standards. The Society will only arrive at suggested methods and standards that are desirable.

The National Standards Committee has drawn up a preliminary list of items to be put under consideration for standardization. It is not complete but will be added to as work progresses.

PRELIMINARY LIST

Items Considered for Standardization

1. Clamping Tonnage—Measurement and Testing
2. Platen Data
   a. Holes—Tapped: Pattern and Spacing
   b. T-Slots: Pattern and Spacing
   c. Ejector Positions
   d. Position of Shot Hole with respect to the center of the platen
   e. Platen Dimensions
3. Standardization of Terms (Glossary)
4. Gooseneck Standards
5. Safety
   a. Safety Blocks
   b. Drilled Piston Rods
   c. Fire Resistant Fluids
   d. J.I.C. Electrical and Hydraulic Items

Everyone in the Die Casting Industry is encouraged to participate in this standardization program. If you are located near a local chapter of the Society of Die Casting Engineers, contact the chapter's Secretary for information on the meeting time and place of its Standardization Committee. Any and all suggestions are also welcomed by the National Offices in Detroit.

■ ■ ■

The members of the National Standards Committee present at the March 5th meeting were:

E. C. Kron – Doehler-Jarvis Div., Nat. Lead Co. – Toledo, Ohio

C. Tice – Delco-Remy Div., GMC – Anderson, Indiana

A. S. Linzell – Hydraulic Press Mfg. Co. – Detroit, Mich.

F. Halward – Detroit Mold Engineering – Detroit, Mich.

A. K. Unterkofler – Ternstedt Div., GMC – Flint, Mich.

M. R. Tenenbaum – Lester Phoenix, Inc. – Detroit, Mich.

G. F. Griffenham – Mergraf Oil Co. – Detroit, Mich.

John Lapin – Saginaw Bay Industries – Bay City, Mich.

Chapter

1 DETROIT and 2 SAGINAW VALLEY

Chairman:	John L. Miller, H & M Industries, Inc.
Vice Chairman:	Richard P. Baribault, Aluminum Company of America
Secretary-Treasurer:	Ollie Clayton, Permanent Mold Die Co.
Librarian & Historian:	Sam Donabedian, Samson Design Service
Chairman of Trustees:	Louis W. Blauman, B & T Engineering & Sales Co.
	Armand Millier, Nu-Engineering, Inc.
	Richard P. Sullivan, Jr., Detroit Mold Engineering Co.

DIE CASTING DIE FAILURES was the topic of a talk given by Dr. John C. Hamaker, Jr., Manager of the Research Department of Vanadium-Alloys Steel Co. at the March 5, 1957, joint meeting of the Detroit and Saginaw Valley Chapters at the Devon Gables in Bloomfield Hills, Michigan. Dr. Hamaker spoke about the cause and effect of heat check in cold chamber die casting. He described the research that was being carried on to develop check resistant die steels and told of the progress to date.

BUILDING OF NEW DIES FOR PRODUCTION was the subject of a talk given by Kenneth Moulder, General Superintendant of the Die Cast Department, Johnson Motors, at the June 4, 1957, joint meeting of the Detroit and Saginaw Valley Chapters at the Devon Gables. Mr. Moulder detailed the procedure involved in placing a new die in service from the design room to shop production. In the design room the placing, the parting and the cores of the die are designed. Detailing follows, and then manufacturing of the die. The hardened die is set up and test operations begun. After testing, the operations are set to get maximum performance from both the machine and the die. As a final step, complete records are kept of any die or operational changes for future reference.

The April 7, 1957, joint meeting of the Detroit and Saginaw Valley Chapters of the S.D.C.E. featured a talk on ALUMINUM IN THE DIE CASTING INDUSTRY presented by R. L. Williamson, Product Manager of Pig and Ingot Sales, Aluminum Company of America. The talk was highlighted by a movie on the industrial design applications of aluminum. Mr. Williamson discussed the present availability of aluminum for the die casting industry and forecast that the future will provide a growing availability. He spoke of the economic promise of aluminum die casting and of the increasing percentage of aluminum die castings being made. For the future, Mr. Williamson predicted more primary metal for the die casters thus decreasing the industry's dependance on secondary metal.

3 WESTERN MICHIGAN

Chairman:	Carl H. Neuendorf, Keeler Brass Co.
Vice Chairman:	Charles Laitsch, Grand Rapids Brass Co.
Secretary-Treasurer:	Leslie W. Haisen, Vickers, Inc.

HYDRAULIC PROGRESS IN THE DIE CASTING INDUSTRY was the subject of a talk presented by Leslie W. Haisen, Application Engineer, Vickers, Inc., at the February 12, 1957, meeting of the Western Michigan Chapter. Mr. Haisen is the present Secretary-Treasurer of this Chapter.

The March 12, 1957, meeting of the Western Michigan Chapter of the S.D.C.E. was highlighted by a talk on die release agents. Irving C. Peterson, Technical Field Director, and Jim Thompson, sales engineer, both of Mergraf Oil Co., presented a talk on THE USE OF MOLD RELEASE AGENTS IN DIE CASTING.

A talk on DIE CASTING DIE FAILURES by Dr. John C. Hamaker, Manager of the Research Department, Vanadium-Alloys Steel Co., was featured at the April 9, 1957, meeting of the Western Michigan Chapter. Dr. Hamakers topic was heat check in cold chamber die casting.

er News

4 TOLEDO

Chairman: Wesley L. Wight, Chevrolet Passenger Transmission Division, General Motors Corp.

Vice Chairman: Charles W. Hodan, Ford Motor Co.

Secretary-Treasurer: T. E. Hansen, E. F. Houghton & Co.

Librarian & Historian: Paul Phillips, Chevrolet Passenger Transmission Division, General Motors Corp.

Chairman of Trustees: Rolland S. Fulton, Jr., Chevrolet Passenger Transmission Division, General Motors Corp.

Trustees: John E. Preas, Latrobe Steel Co.

George F. Hodgson, Doehler-Jarvis Division, National Lead Co.

Dr. John C. Hamaker, Jr., Manager of the Research Department, Vanadium-Alloys Steel Co. was the featured speaker at the March 12, 1957, meeting of the Toledo Chapter of the S.D.C.E. Dr. Hamakers talk, DIE CASTING DIE FAILURES, provided an excellent discussion of heat check in cold chamber die casting.

ALUMINUM AND ZINC ALLOYS IN THE DIE CASTING PROCESS was the title of a talk presented by Donald L. Colwell, Director of Laboratories, Apex Smelting Company, at the April 9, 1957, meeting of the Toledo Chapter of the S.D.C.E.

5 CHICAGO

Chairman: John M. Atols, Atols Tool & Mold Corp.

Vice Chairman: James R. Stockner, Western Electric Co., Inc.

Secretary-Treasurer: Robert A. Wunderlich, Mid-Western Die Casting Co.

Librarian & Historian: William D. Johnson, Bell & Howell

Chairman Of Trustees: Alfred J. Prickett, Western Electric Co., Inc.

Trustees: William F. Schmidt, Western Electric Co., Inc.

William D. Johnson, Bell & Howell

Ray P. Dunn, United States Reduction Co.

Walter P. Davis, Admiral Die Casting

6 CLEVELAND

Chairman: Harry Cagin, The Halex Die Casting Co.

Vice Chairman: Arnold Williams, Cleveland Hardware & Forging Co.

Secretary-Treasurer: Robert D. Black, Rex Oil & Chemical Co.

Chairman Of Trustees: Joseph A. Goldsmith, Buckeye Mold & Die Co.

Trustees: David M. Morgenstern, Nelmor Manufacturing Corp.

Fred J. Neumann, Conneaut Die Casting Co.

John W. Palmer, Cast-Master, Inc.

John Ryder

John B. Schoonover, Helfrich Die Cast Products Co.

Mr. Joseph A. Goldsmith, Program Chairman, announces the September and October programs for members and guests.

On September 17th there will be a Clambake. The time and place to be announced later by the Committee Chairman, John W. Palmer.

On October 15th there will be a meeting at the West Side Turnverein at 6:30 P.M. Mr. D. M. Morgenstern, Vice President, Nelmor Manufacturing Co., will speak on HOT AND COLD CHAMBER VACUUM DIE CASTING.

Casting Around

by THEODORA SIMONEAU

THE ENORMITY of the die casting industry and its versatility is beyond the imagination of those unacquainted with the industry. I, for one, little realized until just lately its usefulness and the important role die castings play in our everyday life.

It was with much surprise that I learned that die casting has been dropped from some trade schools and that even the University of Minnesota offers no regular course. In view of the demand in die casting for trained men, this seems to me to be a very unfortunate situation. This is where the S.D.C.E. can play a big role and make people in the profession aware of this situation; however, on-the-job training is doing a lot to ease the shortage of trained men.

April 11th will be a day for me to remember. It started with a telephone call to the Char-Lynn Co. of Minneapolis, Minnesota, who manufacture aluminum die castings weighing from a few ounces to 25 pounds, and culminated with a visit to the plant, a sight-seeing tour, and finally the permission of the president of the company, Mr. L. L. Charlson, to spend some of my future Saturdays with the company learning something of the die casting trade. In subsequent articles I shall be more specific about the doings of this grand company, its people, and what I am learning.

My tour was conducted by Mr. M. F. Miller, Sales Manager of the Die Casting Division. We spent a brief period of time in his office while he answered my numerous questions, and then we began a tour of the plant. Our first stop was in the machine department. I couldn't help but notice how well the machines and areas were kept free of obstructions that could cause injury, and that each person wore safety glasses. The women wore hats to keep their hair back and away from the machinery. In each department I was aware that safety counted to the people in this plant.

From there we went to the die casting machines. What a sight to behold! I was dumbfounded, for my mental picture of die casting was certainly not the one which I now saw—the huge furnaces with their loads of hot metal, the men ladling out this metal and pouring it into the cold wall, and then the press of a button and another casting is made. Exact timing of the whole process is the all important thing, for mistiming can mean freezing of the metal or an explosion if the mold is opened before the metal has set. The die casters must know exactly what they are doing without any guess work. These machines were the smaller ones. Our final stop was to see a newly purchased 800 ton capacity die casting machine.

And so I came to the end of my indoctrination into the die casting industry.

■ ■ ■

DIE RELEASE AGENTS

(Concluded from Page 14)

has a higher resistance to compacting or settling-out in a liquid vehicle. The flake or flat particles tend to be oriented with the flat sides parallel to the die surfaces providing a larger amount of coverage with a minimum of pigment.

The ash content of various types of graphite vary from 5 to 40% depending upon the source. This ash residue is highly abrasive and detrimental to both die surfaces and moving parts such as cores and ejector pins. Also, the residue will build up in the die cavities obscuring detail.

In the selection of the vehicle, only high flash point stocks highly resistant to breakdown, oxidation or varnishing at high temperatures are selected. Most oils contain sulphur, and only materials relatively free of sulphur are selected. Sulphur will react with hot die surfaces to form a hard and brittle surface layer. The repeated formation and breaking-off or spalling of this iron sulphide surface results in excessive wear on the dies.

In addition to the selection of the vehicle and pigment, various types of additives are used, such as various soaps or deflocculating agents to maintain a uniform dispersion or suspension of the pigment in the product - both during use and storage.

Lubricity additives are incorporated to provide the desirable slip for easy removal of cores and to prevent freezing and excessive wear on die parts.

Polar type wetting agents are used to insure a rapid and complete wetting-out and coverage of the die surface at operating temperature. The polar active agents promote adhesion of the coating to the die and enable the parting film to resist displacement under conditions of high temperatures thus preventing metal-to-metal contact and protecting the die surfaces from checking and abrasion.

Some mold coatings contain additives which impart thixotropic properties to the product upon heating. This causes the compound, which has a fluid sprayable consistency at room temperatures, to thicken immediately after it wets-out the hot metal surface. Normally, the heating of a conventional oil base product in contact with a hot die will reduce the viscosity or consistency and the coating will run away or will not adhere.

While considerable progress has been made over the years in the field of mold coatings, particularly with the introducion of silicone fluids, research is constantly searching to develop new and more effective mold coatings to meet the advancing needs of today's die casting industry. ■ ■ ■

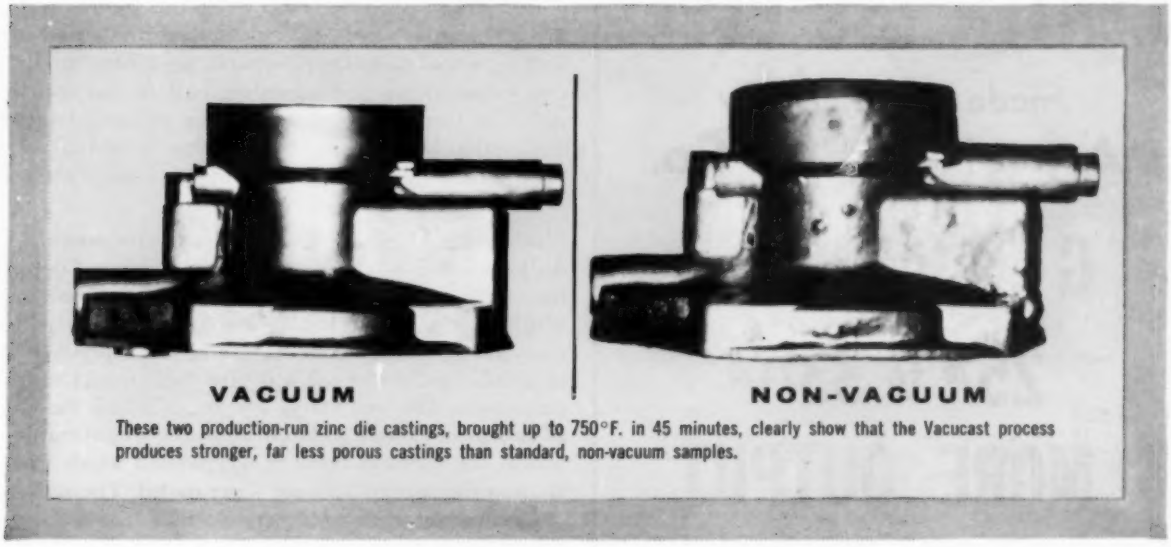
Meet the Author

TOM MURRAY received his B.A. degree in Chemistry in 1948 from LaSalle College at Philadelphia. He was first associated with the Henry Bower Chemical Co. as a chemist. In March of 1953, Tom joined E. F. Houghton & Co. as a Service Engineer for their Metal Working Products Department. In the past four years he has worked a great deal with die release agents that are used not only in die casting but in many of the other casting processes.

He is a member of the American Chemical Society, the AES, the ASM and is an associate member of the Franklin Institute.

New Reed-Prentice Vacucast Process Gives

DENSER, STRONGER ZINC CASTINGS!



These two production-run zinc die castings, brought up to 750°F. in 45 minutes, clearly show that the Vacucast process produces stronger, far less porous castings than standard, non-vacuum samples.

Here's a big, new improvement in zinc die casting – the Reed-Prentice Vacucast system. Offered as original equipment *only* on REED die casters, this new vacuum casting process gives you higher quality castings than were ever possible before, and at a lower cost.

Exhaustive testing, conducted on Vacucast zinc castings by an independent testing laboratory, show the superiority of this new process. Here are some of the advantages you get with this new vacuum die casting operation:

- Up to 20% faster cycling
- Rejects cut by 50%
- Surface quality improvement greatly reduces polishing and buffing
- Increased hardness and strength, less permeability
- Porosity practically eliminated
- As much as .02" greater skin thickness in thin castings
- Big metal savings through permissible reduction in wall thickness
- Can use existing dies without alteration

ALUMINUM DIE CASTING TOO!

Now under final development and test – a new aluminum self-feeding Vacucast machine process. Watch for an announcement by Reed-Prentice for this newest engineering advancement.

To get complete information on the new Vacucast process, write today to Reed-Prentice Corp., 677 Cambridge Street, Worcester 4, Mass.

REED-PRENTICE

Affiliate of PACKAGE MACHINERY COMPANY

WORCESTER 4, MASS.

BRANCH OFFICES: NEW YORK • CLEVELAND • CHICAGO • BUFFALO • DAYTON • DETROIT • KANSAS CITY • LOS ANGELES

A DIE DESIGNER'S PROBLEMS

(Concluded from Page 16)

a too thin gate will prevent the proper filling of the die cavity. Thick gates promote soundness and better physical properties. Generally, the size of the gate is a compromise, designed to arrive at a workable optimum thickness.

It is desirable to provide one or more overflow wells on the vented side of the castings. The wells help unify the die temperature and catch some of the metal which has passed through the die cavity. They provide space into which air which might otherwise be trapped in the casting to escape or be trapped in the well where it will do no harm. Wells are joined to the cavity by shallow openings and are later broken or sheared off with gates and flash. Overflow wells are vented to facilitate escape of air and constitute part of the venting system of the die. These wells, when properly located often contribute more to soundness, uniformity of strength and surface finish than any other single feature of die design.

Die casting dies intended for rapid production are drilled to provide channels for water cooling. Cooling not only prevents the die from reaching a temperature which may tend to shorten its life, but also helps to maintain a die temperature favorable to the production of satisfactory castings at a desired high rate. Flexible hose connections and valves are used to adjust the rate of flow to an amount sufficient to hold die temperatures within the required limits. Cores around which thick sections are cast generally are water cooled. The amount of cooling water required depends upon the temperature of the metal being cast, the heat capacity of the metal and the rate of casting production.

Logical design produces economical product

It is easy to grasp the major considerations upon which logical die design is based. While the designer of castings rarely, if ever, designs the die which will produce his casting, he can easily appreciate just what a particular design will require from the die caster. If the casting is designed with the fundamentals of the die cast process in mind, a most economical product will result.

ALFRED SUGAR is Vice President and Technical Director of Alloys and Chemicals Manufacturing Co., Inc. in Cleveland, Ohio.

Mr. Sugar is a graduate of Case Institute of Technology in Cleveland and has had thirty years experience in the Metallurgical field. He is the author of many technical papers and holds many patents that pertain to the die casting industry. Mr. Sugar has also given lectures at Stevens Institute of Technology.

FIRST SDCE PLANT TRIP SUCCESSFUL

Die Casters See Production of Turboglide Transmissions

Left to right:

Mr. C. A. Dwight, Personnel Director*; Mr. John Morris, Production Superintendent*; Mr. C. C. Brewer, Operations Manager*; Mr. F. Feldt, Production Superintendent*; Mr. Harry Shimel, Production Superintendent*, Director**; Mr. C. Moore, Master Mechanic*; Mr. George Griffenham, Executive Secretary**; Mr. Wesley Wight, Production Supervisor*, Chairman, Chapter #4**; Mr. Harry Cagin, Vice President**; Mr. Robert D. Black, Secretary, Chapter #6**.

* Chevrolet Passenger Transmission
** The Society of Die Casting Engineers, Inc.

Below, Die Casters from all over the country look over the 1200 ton die casting machine.

This machine produces the aluminum Turboglide transmission casing (left, foreground). It was one of the many highlights in the plant tour.

RAIN AND OVERCAST SKIES couldn't put the damper on the Society of Die Casting Engineers first plant trip. The Chevrolet Passenger Transmission Plant of General Motors welcomed members of the SDCE and their guests from all over the country on April 4th and 5th. In spite of the weather, a large number of die casters turned out to see the latest die casting and production methods being used in the manufacture of the Turboglide automatic transmission casings and internal parts.

Due to its large size and weight, its strength requirements, and the intricacy of its inner and outer surfaces, the Turboglide casing proved to be the center of attraction. Some of the details of the casting operation include the use of a huge die casting machine which exerts a locking pressure of 1200 tons. The force applied to the molten aluminum by the ram is 617,026 pounds. Feeding of the die, which weighs no less than 17½ tons, with the molten metal is automatically controlled and operated.

As a general interest note, a display of the cut-a-way transmission with its internal parts in motion was supplied by Chevrolet for the visitors. An animated picture story of the transmission's total production was also a part of the display.

The modern chemical and metallurgical laboratory adjacent to the die casting area was an eye-opener for those familiar with metal testing laboratories. Contained in four large, airy rooms are the complete and spotlessly clean chemical facilities, a complete pyro-metallurgical laboratory for the study of better alloys, standard testing equipment, and a new spectrographic-computer. The computer section of the spectrograph cuts the time between sample and analysis to a mere 10 minutes.

A great deal of thanks goes to Chevrolet Division of General Motors for making the April plant trip a success.

■ ■ ■

WE ALL HAVE 'EM:

Problems that is . . .

. . . How did you

solve the ones you had?

It seems that no two of our problems are the same—some similar, but never the same. Which die lubricant to use, what alloy, whose die steel—a never ending list on every job. BUT—there are plenty of other die casters who probably have *exactly* your problem. Possibly not at the same time, but in the near future or just lately.

In order for the Die Casting Industry to progress as rapidly as the demand for our products dictates, we must have some reference to the latest methods of solution to the problems of die casting. Rather than start from scratch every time in the quest for better die castings, we need only to refer to the previous work of others in the same field and carry our research on from there. The subsequent conclusions of this advanced research must then be fed back for the whole industry to utilize.

The staff of the *Die Casting Engineer* requests the opportunity to publish any information that is vital to the whole Industry or any of its parts, as highly technical as possible. However, before it may be published, the information must find an author.

. . . That author is YOU.

Send the outline of your article to:

DIE CASTING ENGINEER
19370 James Couzens Hwy.
Detroit 35, Michigan

We will let you know the acceptability of the material and guide you in its presentation.

Our Problem—Advertising

EVEN THOSE DIE CASTERS somewhat removed from the intricate everyday problems of producing a perfect die casting can do a great deal to accelerate progress in the Die Casting Industry.

By advertising in the *Die Casting Engineer* you will directly strengthen all corners of the Industry in aiding the process of communication. More pages of ads carried in the magazine mean more open pages for technical feature articles. As we increase the number of these articles we will be able to cover an increasingly wider range of die casting fields in each issue.

A quality of the *Die Casting Engineer* is its practical engineering presentation of the newest solutions to die casters' everyday production and design problems.

Included in the membership of the Society and receiving the *Die Casting Engineer* are the men who determine the sources of machines, metals, and allied supplies for the large manufacturers of die castings. Buyers of die casting, who are ever selecting new sources of die castings, are also included in our mailing lists.

Our circulation for this issue is 2,700 plus.

For further information write:

Vincent T. Purcell
317 Stephenson Bldg.
Detroit 2, Michigan
TRinity 5-7978

PEOPLE IN DIE CASTING

Harris Shimel leaves Chevrolet Division of GMC.

Because of his health, Harris Shimel, first National President of the Society of Die Casting Engineers, has left the Chevrolet Division of General Motors after twenty-six years of service. He has joined Mr. Walter D. Speicher in his manufacturer's representative business.

Mr. Shimel and Mr. Speicher cover a broad field including die cast dies, trim dies, sheet metal dies, jigs, fixtures, gages, trim presses, special machinery, buffing fixtures, metal stampings, and die castings.

His address is: 300 C.P.A. Building
Michigan Avenue and W. Vernor Hwy.
Detroit 16, Michigan
WOodward 2-7167, -7155

"Teddy" Simoneau ties in closer with die casting.

Miss Theodora E. Simoneau has left the O. W. Kromer Co. of Minneapolis, Minnesota and has joined the Western Alloyed Steel Casting Co., 2901 Pleasant Avenue, Minneapolis. As a chemist and radiologist she will be working closely with Professor Fulton Holtby of the University of Minnesota. Her work will carry her into the fields of die layout, casting design, and casting techniques.

George Griffenham accepts new position in die cast die sales and service.

George F. Griffenham, Executive Secretary of the Society of Die Casting Engineers, has accepted the position of General Sales Manager with the Sterling-Detroit Company, 261 E. Goldengate Avenue, Detroit 3, Michigan. His duties will be directed at increasing Die Cast Die sales, Master Unit Die Holders, and general Engineering Service for the Die Casting Industry.

Mr. Griffenham recently left the Mergraf Oil Products Co. He is one of the founders of the Society.

New Jersey Zinc gains new manager

Robert L. Campbell has been appointed Manager of Metal Sales, Western Division, of the New Jersey Zinc Company. His headquarters will be at Chicago, Illinois.

Mr. Campbell, an alumnus of Ripon College and a former Captain in the U.S. Infantry during World War II, started his employment with the company in 1946 as a sales representative. He has been attached to their Metal Division since 1952.

Mr. Campbell is an active member of the Chicago Chapter of the SDCE.

PEOPLE IN DIE CASTING

Lawrence May takes on a new title and company.

Lawrence R. May, formerly General Manager of Cast-Master, Inc. of Cleveland, Ohio, has been named Vice President and General Manager of the B & T Machinery Co. of Holland, Michigan, according to Jay H. Petter, B & T President.

Having spent his entire life in the manufacturing business, he goes to the B & T Machinery Co. with a background of experience in all phases of manufacturing, particularly in the engineering and development of plastic injection molding and die casting equipment. He is widely and favorably known in the machinery field.

The B & T Machinery Company manufactures and distributes nationally a complete line of machines for die casting zinc and aluminum in capacities ranging from 100 to 750 tons.

Ralph Burns dies suddenly

Ralph F. Burns, former Manager of Metal Sales, Western District, of the New Jersey Zinc Company, passed away on March 29, 1957 at the age of 59. Mr. Burns had been a very active member of the Chicago Chapter of the Society of Die Casting Engineers.

ADVERTISERS INDEX

NEW DEVELOPMENTS

STUDRIVE, INC. ANNOUNCES NEW STUD DRIVER

A NEW UNIT to eliminate the production bottleneck often encountered when studs are being driven into finished die castings has been developed by Studrive, Inc., of Detroit.

This unit is air operated and features carbide inserts in the stud delivery mechanism for longer wear. The method of delivering the studs, one-at-a-time, is unique in that it is mechanically controlled by a rack-and-pinion, thus eliminating all need for timed limit switches. Power requirements for the stud driver are air at 70 to 80 psi to operate the driver mechanism and 110 volt - 60 cycle power for control switches and the vibratory hopper. Air consumption is low, being 0.2 cu. ft. per cycle.

The units may be operated singly or grouped together and operated from one control when a die casting calls for more than one stud. They can be readily rearranged for new stud spacing or change-over. Proper positioning of the stud drivers is facilitated by dowel pins located in the part fixture at the stud centers. The part fixture is the only mechanical link between units. The operation pictured is typical of a two-stud arrangement.

From the Executive Secretary:

Please check your Name and Address on your membership card or on the envelope that came with the *Die Casting Engineer*. Please notify the SDCE if it is incorrect in any way . . . spelling, title, zone, etc.

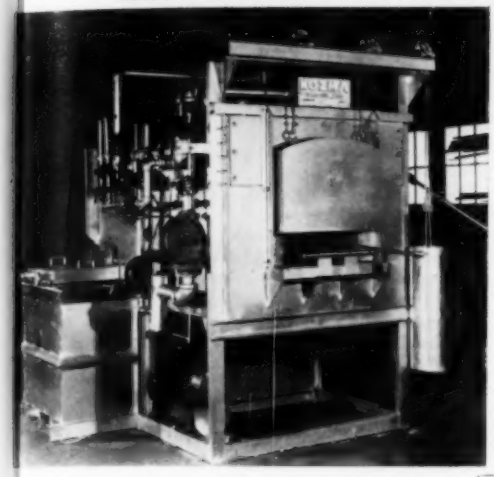
Thank you.
G. F. Griffenham

A COMPLETE LISTING of all 67 different types of its zinc die cast and thermoplastic molded products, in Sections I and II, is offered by the Gries Reproducer Corp. in its new release, "Services and Products Bulletin."

Write: Gries Reproducer Corp., 125 Beechwood Ave., New Rochelle, N. Y.

NEWS AND COMMENTS from die casters on their experience with Lester die casting machines is offered quarterly in "Lester Press," published by Lester-Phoenix, Inc.

Write: 2716-M Church Avenue, Cleveland 13, Ohio.



NEW ALUMINUM FURNACE GIVES HIGHER EFFICIENCY WITH OVERHEAD BURNERS

The J. A. KOZMA COMPANY, 2471 Wyoming Avenue, Dearborn, Michigan, announces its new RADIANT ALUMINUM DIE CASTING FURNACE which melts and holds all in one compact unit. The charge enters at one end, is melted, and flows into a holding well ready for ladling.

The furnace is fired by overhead radiant cup burners which eliminate flame impingement and localized over-heating of the metal. The reducing atmosphere in the furnace minimizes the build-up of alumina on the surface of the melt.

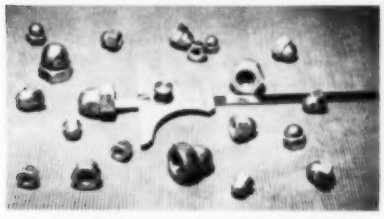
By virtue of design and excellent temperature uniformity, metal loss is held at a minimum, metal quality is increased, melting is faster, and operator comfort is greatly increased.

The furnace is available with melting and holding capacities to meet most requirements.

HIGH DOME CAP NUTS

A new line of die-cast zinc alloy "high series" cap nuts has been introduced by Gries Reproducer Corporation, New Rochelle, N. Y., to provide industry with an improved means of covering exposed bolt ends of varying lengths. These corrosion resistant GRC high series cap nuts provide up to 50 per cent greater thread depth. The deeper thread is achieved by an increase in the overall height of the cap nut, well proportioned between the hexagonal section and the dome of the fastener.

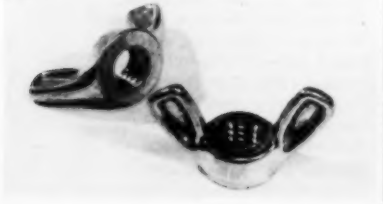
The newly engineered high series cap nuts, in the front row, are shown next to standard nuts for comparison.



INEXPENSIVE WING NUTS

"Economy Series" wing nuts, a new stock item available from Gries Reproducer Corporation, New Rochelle, N. Y., offer noticeable savings without sacrificing quality or appearance. Die-cast of zinc alloy on fully automatic machines, they are lighter in weight and less costly than the other two types produced by GRC.

The new fastener has a wing spread of from 3/4 in. to 1 1/4 in. Thread sizes range from No. 6 to 3/8 in. (NC-2 or NF-2), all made to Unified Thread Series specifications. Zinc alloy die-cast wing nuts are corrosion resistant and generally require no further finishing.



New Aluminum Foundry for Massena, New York, planned by Chevrolet Division of General Motors

General Motors plans to establish a new foundry for the manufacture of aluminum castings for automotive parts near Massena, New York. The proposed new plant will be operated by the Chevrolet Division.

General Motors and Reynolds Metals Company have entered into an agreement under which Reynolds will provide aluminum from a reduction plant to be built near by. The major advantage of having a foundry near an aluminum reduction plant is that the aluminum can be transported directly in a molten state from the electrolytic cells to the foundry and poured immediately. Otherwise, it is produced in ingots for transporting and storage and then melted down before being used for casting the ultimate product.

Establishment of the plant is contingent upon approval by New York State officials of the proposal by the Reynolds Company for it to use electric power furnished by the Barnhart Island Power Station in the Saint Lawrence Seaway System. Construction of this new station was recently approved by the New York State Power Authority.

SDCE SUPPORTING COMPANY MEMBERS

All State Industries, Inc.
Center Line, Michigan

American Mold Engineering Co.
Charlevoix, Michigan

Atols Tool and Mold Corp.
Chicago, Illinois

Atlantic Chemicals and Metals Co.
Chicago, Illinois

B and T Machinery Company
Holland, Michigan

Briggs and Stratton Corp.
Milwaukee, Wisconsin

Central Die Casting & Mfg. Co., Inc.
Chicago, Illinois

H. Cohn and Sons
Chicago, Illinois

Congress Die Casting Division
Tann Corporation
Detroit, Michigan

Conneaut Die Casting Co.
Conneaut, Ohio

Crucible Steel Co. of America
Syracuse, New York

Detroit Mold Engineering Co.
Detroit, Michigan

Disdie Steel, Inc.
Van Dyke, Michigan

Dominion Die Casting, Ltd.
Wallaceburg, Ontario, Canada

General Motors Corporation
Process Development Staff
Detroit, Michigan

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Detroit, Michigan

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Kenmore, New York

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Latrobe, Pennsylvania

R. Lavin and Sons, Inc.
Chicago, Illinois

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Lindberg Steel Treating Co.
Melrose Park, Illinois

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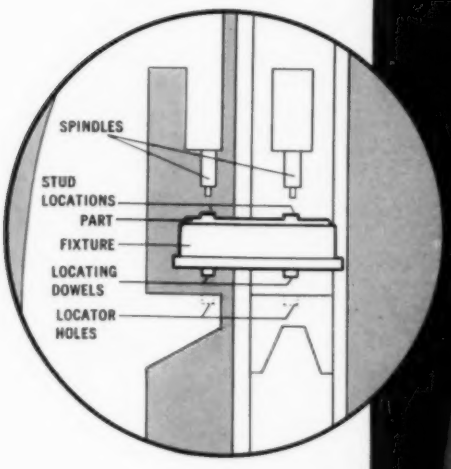
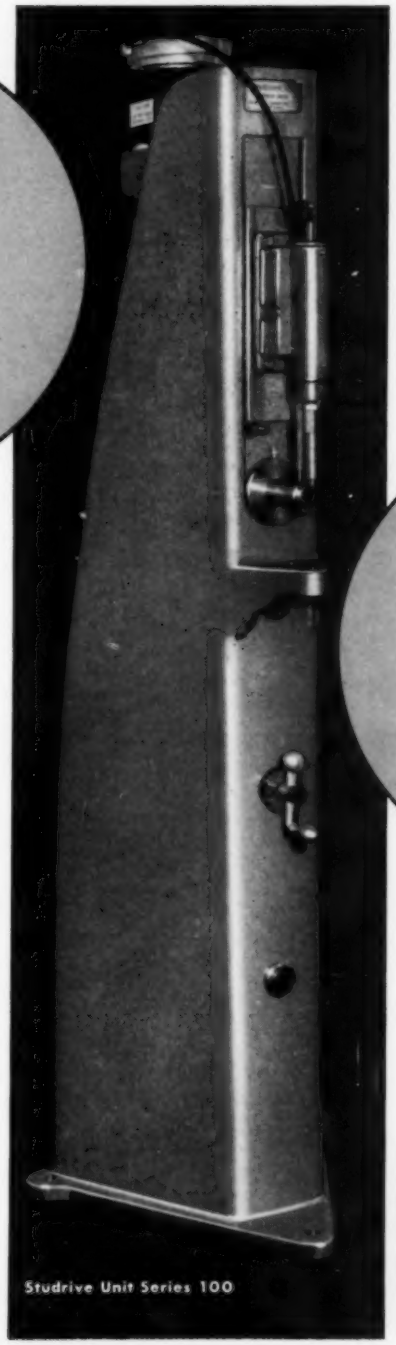


Locating dowels in fixture base, directly under each boss, match pedestal holes to provide perfect spindle line-up.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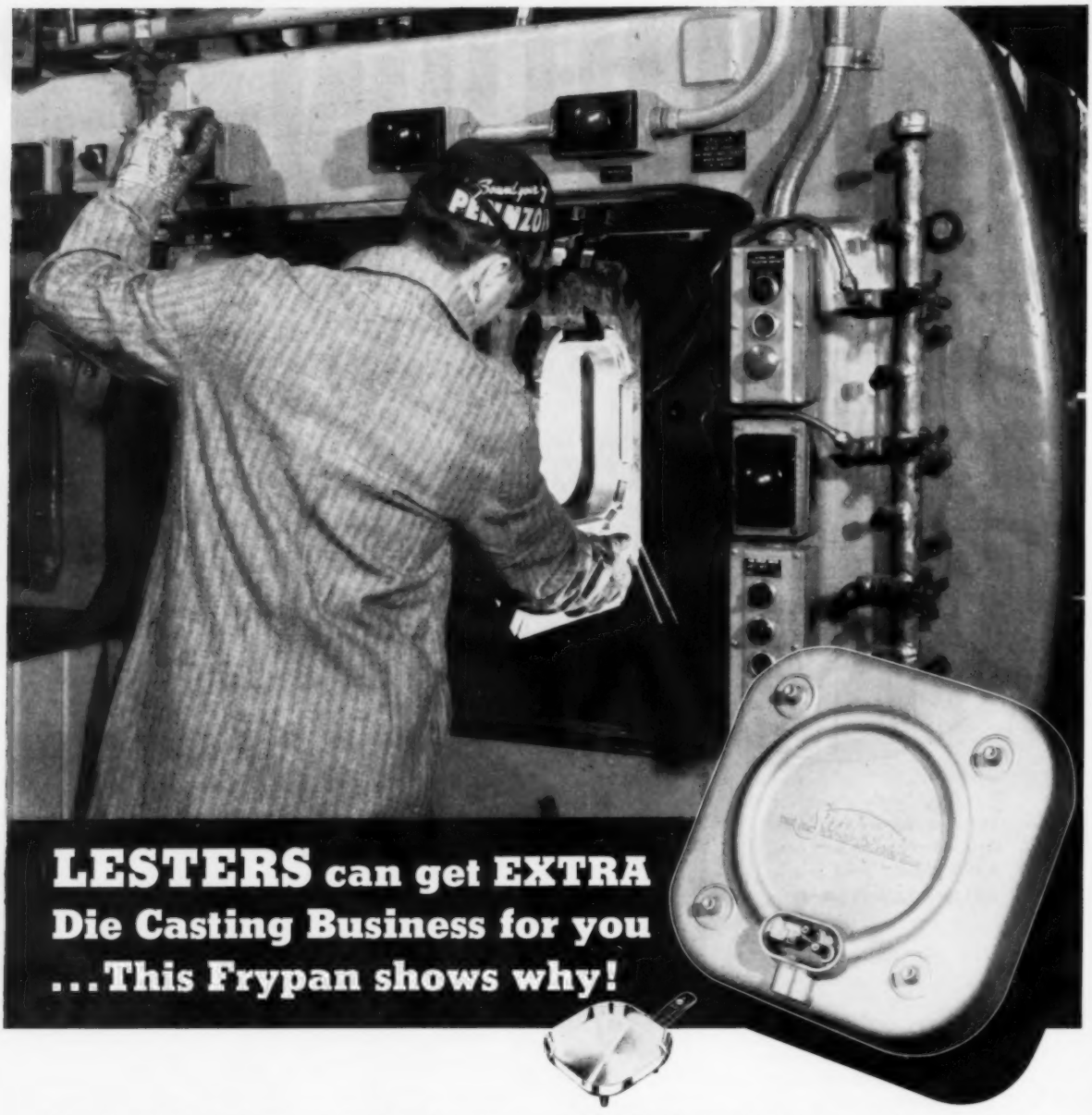

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Complete machine specifications available in Bulletin 101. WRITE TODAY.

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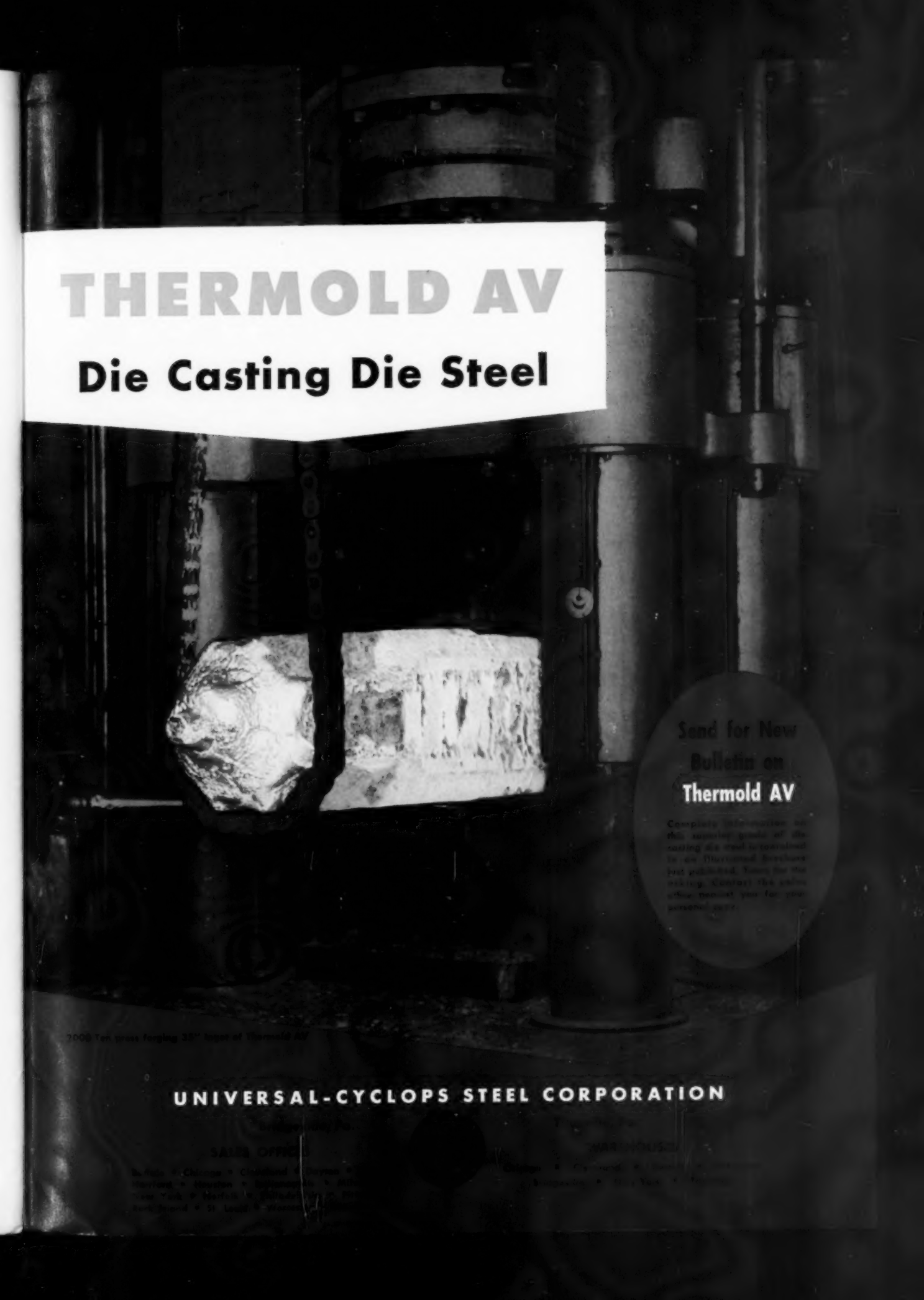
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